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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,832	09/30/2003	James Mac Freitag	HSJ9-2003-0070US1	6643

7590 10/18/2005

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EXAMINER	
CAO, ALLEN T	
ART UNIT	**PAPER NUMBER**
2652	

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/675,832	FREITAG ET AL.	
	Examiner	Art Unit	
	Allen T. Cao	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-10, 12-20 and 22-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (figures 1-10; specification, page 5 to page 10, line 22) in view of Gill (US. 6,452,763 B1).

The admitted prior art discloses a disk drive 30 having a housing (figure 1); a magnetic disk 34 rotatably supported in the housing; a magnetic head 40; a support (44, 46) mounted in the housing for supporting the magnetic head so as to be in a transducing relationship with the magnetic disk; a spindle 32 for rotating the magnetic disk; an actuator positioning means 47 connected to the support for moving the magnetic head to multiple positions with respect to the magnetic disk; a processor 50 connected to the magnetic head, spindle motor, and the actuator for exchanging signals with the magnetic head for controlling movement of the magnetic disk and for controlling the position of the magnetic head; the magnetic head including a spin valve sensor 200 (see figure 10 of Applicant's admitted prior art) comprising a spin valve structure including a free layer 206; an antiparallel self pinned layer structure 204; a non-magnetic electrically conductive spacer layer 202 (page 7, lines 22-23) in between the free layer and the AP self pinned layer structure; the self pinned layer structure 204

(page 7, line 24 to page 9, line 16) having a first AP pinned layer 212; a second AP pinned layer 210; an antiparallel coupling (APC) layer 208 formed between the first and the second AP pinned layers, all as set forth in claims 1and 12 .

The admitted prior art does not disclose that the at least one of the first and the second AP pinned layer comprises a cobalt layer.

Gill discloses a spin valve sensor having a pinned structure including a first pinned layer 418 made of Co (cobalt, column 7, lines 42-45 disclose "the first AP-pinned layer 418 [SIC: 418] may be a layer of Co or CoFe).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the first pinned layer of the admitted prior art with a cobalt material as taught by Gill.

The rationale is as follows: One of ordinary skill in the art would have been motivated to manufacture the first pinned layer of the admitted prior art with a cobalt material as taught by Gill to improve structure and composition of the pinned layer, thus provide increased specular scattering, and, in turn improved performance of the overall disk drive system.

Regarding method 23, all the method steps are inherently met in the above rejection. Gill also discloses that Co helps increased MR coefficient and substantially improves the overall performance of the spin valve sensor.

Regarding claims 2, 13 and 24, Gill discloses that the at least one AP pinned layer comprising the cobalt layer consist of cobalt (column 7, lines 42-45).

Regarding claims 3, 14 and 25, Gill discloses that the at least one AP pinned layer comprises the cobalt layer includes no iron content (see also column 7, lines 42-45).

Regarding claims 4 and 15, Gill discloses the other AP pinned layer (the second pinned layer) comprises a cobalt-iron layer (column 4, lines 15-17).

Regarding claims 5 and 16, Gill discloses the first and the second AP pinned layers each comprises a cobalt layer (figure 2 of Gill shows the first pinned layer 216 and second pinned layer 212 made of Co).

Regarding claims 6, 17, 26 and 28, Gill discloses the second AP pinned layer comprising the cobalt layer with no iron content and the first AP pinned layer comprising a cobalt-iron layer (Gill discloses one of the pinned is made of Co and the other made of CoFe); see the above rejection.

Regarding claim 7, the admitted prior art inherently discloses that the AP self-pinned structure is pinned by its magnetostriction and air bearing surface stress (no AFM and self-pinning).

Regarding claims 9, 20 and 29, the admitted prior art discloses that an antiferromagnetic (AFM) layer is not utilized for pinning the AP self-pinned layer structure.

Regarding claims 18 and 30, the admitted prior art discloses that the free layer (F1, figure 10) comprises a cobalt-iron layer.

Regarding claims 8, 10, 19, 22 and 27, Gill inherently discloses that the magnetostriction of the pinned layers are increased (see discussion in column 4, lines 12-32).

3. Claims 11 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art and Gill as applied to claims 1 and 12 above, and further in view of Mao (US. 6,700,760 B1).

The admitted prior art as modified by Gill only disclose that the seed layer has a thickness less than 75 Angstroms (Gill, column 7, lines 1-12).

The admitted prior art as modified by Gill do not disclose that the seed layer is made of PtMn.

Mao discloses a spin valve having a seed layer 170 made of PtMn (column 5, line 30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the seed layer of the spin valve sensor of the admitted prior art as modified by Gill with a PtMn material as taught by Mao.

The rationale is as follows: One of ordinary skill in the art would have been motivated to manufacture the seed layer of the spin valve sensor of the admitted prior art as modified by Gill with a PtMn material as taught by Mao to improve the pinning characteristics of the pinned layers in order to improve write characteristics of the head.

Response to Arguments

4. Applicant's arguments filed 7/26/05 have been fully considered but they are not persuasive.

In the Remarks, Applicant asserts that the combination of the admitted prior art and Gill is not a proper basis for rejection because of "In response, ... By proportional increasing the iron content in cobalt-iron pinned layers, ... As apparent, one ordinary skilled in designing a self-pinned structure would tend to utilize more iron content in the pinned layers – not, as the Examiner suggests, little or no iron ... in the pinned layers" teaches away from Gill because it suggests the use of higher iron content cobalt-iron, not pure cobalt .." (see Applicant's Remarks, page 9 to page 11).

The Examiner respectfully points out that Applicant argues the limitations which are not in the claims. Applicant only claims that the AP pinned layer **"comprises"** a cobalt layer. Applicant neither claims that the AP pinned layer "consists of" a cobalt layer or "pure cobalt" nor that the purposes of the "pure cobalt" AP pinned layer as Applicant's argument in the REMARKS.

The admitted prior art discloses all limitations except for the at least one of the first and the second AP pinned layer comprises a cobalt layer.

Gill has been relied upon for disclosing a spin valve sensor having a pinned structure including a first pinned layer 418 made of Co (cobalt, column 7, lines 42-45 disclose "the first AP-pinned layer 418 [SIC: 418] may be a layer of Co or CoFe).

Therefore, the Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the first

pinned layer of the admitted prior art with a cobalt material as taught by Gill to improve structure and composition of the pinned layer, thus provide increased specular scattering, and, in turn improved performance of the overall disk drive system. Additionally, it has been held to be within the general skill of a worker in the art to select a known material having different chemical bonding structures on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416 (CCPA 1960).

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen T Cao whose telephone number is (571) 272-7569. The examiner can normally be reached on Mon - Thurs (7:30 - 6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Allen Cao
Primary Examiner

AC
October 11, 2005